On the British Species of the genus Philydrus, Solier (*with plate*).

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The genus *Philydrus* or *Philhydrus*, is represented in Britain by six species, which are described by both Fowler and Ganglbauer as divisible into two groups, *testaceus*, F., *maritimus*, Thoms., *nigricans*, Zett., and *melanocephalus*, Ol., belonging to the one group, the subgenus *Philydrus*, s. str.; *minutus*, F., and *coarctatus*, Gredl., to the other, the subgenus *Methydrus*, Rey or *Agraphilydrus*, Kew.

I have recently been critically examining these six species, and the following notes are the outcome of this examination, written partly because the characters for separating the species as given by Fowler are to some extent unreliable, and partly because it appears to me that the position of the species *nigricans*, Zett., in the same subgenus as *testaceus*, *maritimus* and *melanocephalus* is not satisfactory, considering the character, as given by Fowler* and Ganglbauer†, upon which the group is based. This character is the presence at each side of the thorax of a number of large punctures arranged more or less in the form of a crescent. Fowler separates off this group sharply from the other, which he describes as having "thorax without larger punctures at sides," but Ganglbauer more accurately says that there may be at each side of the thorax in *minutus* and *coarctatus* a few somewhat larger punctures.

Now this series of punctures is quite distinct in *testaceus*, *maritimus* and *melanocephalus*, but in *nigricans* it is much less marked. Large punctures are undoubtedly present in many specimens, if not all, of *minutus* and *coarctatus*, and in some specimens the series is as distinct as in some specimens of *nigricans*. It was this point which first caused me to carefully examine the species.

Fowler does not mention the fact that the tarsal claws of the males of the species have a distinct protuberance or tooth on the underside, while Ganglbauer mentions the character but makes no use of it in separating the species. For my purpose it is sufficient to refer to the tooth on the anterior claw of the anterior tarsi. In *testaceus*, *maritimus*, and *melanocephalus* this tooth is particularly well-marked and is *transversely striated*, as can be seen by removing the claw and examining it by transmitted light under a microscope of moderate power. In *nigricans* there is also a tooth to this claw, rather smaller than in the other three species, but there is *no transverse striation*. In *minutus* and *coarctatus* again the tooth is very much smaller and shows no sign of transverse striation. A glance at the figures given will show the difference in the species.

In *testaceus*, *maritimus*, and *melanocephalus* the elytra show indistinct traces of three rows of larger punctures and the fact that *nigricans* does not show these *striae*,‡ is used both by Ganglbauer and by Fowler for separating this species from the other three. In this character again we find *nigricans* agreeing with *minutus* and *coarctatus* where no trace of the striæ is visible.

Nigricans, therefore, seems to me to be sufficiently distinct from *testaceus*, *maritimus*, and *melanocephalus*, to warrant its removal from

* Fowler, W. W., *Coleoptera of the British Islands*, 1887, vol. i., p. 223.

† Ganglbauer, L., *Die Käfer von Mitteleuropa*, 1904, vol. iv., pt. 1, p. 244.

‡ In some specimens a few larger punctures are to be found.

that group and if it is not sufficiently near to *minutus* and *coarctatus* to permit of its inclusion with them in the subgenus *Methydrus* it should occupy an intermediate position between the two groups.

With regard to the question of distinguishing the different species, the separation of *testaceus* from *maritimus* is easy. The latter species has the head testaceous, "sometimes darker in the middle," and the maxillary palpi are pale testaceous, whereas the former has a black head—not including the clypeus—and the second segment of the maxilliary palpi is dark. The tarsal claws also of the male of *maritimus* are decidedly longer than those of *testaceus*.

In the character of the tarsal claws *testaceus* and *melanocephalus* approach one another closely. As a rule the former species is rather larger and lighter-coloured than the latter, and the latter usually has the second joint of the palpi testaceous, but slight difference in size and difference in general colour are not the best characters to rely upon, nor are they in this case always constant. *Melanocephalus* is occasionally light-coloured—I have a light specimen from West Norfolk. *Testaceus* is occasionally small—one small specimen was through my hands recently. The dark second segment of the maxillary palpi in *testaceus* will, as a rule, distinguish this species from *melanocephalus* in which that segment is usually testaceous, but I have two specimens of the latter species, one from Cork, the other from Antrim, in which the segment is coloured exactly as in *testaceus*. Fowler describes the head of *testaceus* as black with clypeus testaceous, and he describes *melanocephalus* as having a black head presumably including the clypeus! As a rule this distinction holds good but it cannot be relied on as I have specimens of *melanocephalus* from various localities in which the clypeus is more or less testaceous.

The colour of the maxillary palpi is not always "distinctly black at apex" in *melanocephalus* as Fowler states, as in some of my specimens it is entirely pale testaceous. The only character I can find which seems to be reliable in all cases, is the nature of the punctuation of the upper surface, which is rather coarser in *melanocephalus*, than in *testaceus*, that is, in the former the punctures are larger and farther apart than they are in the latter.

Turning now to the two small species, Fowler separates them according to the colour of the clypeus and of the last segment of the maxillary palpi.

Now the colour of both these parts is variable in *testaceus*, *melanocephalus* and *nigricans*, especially in the two latter. In *melanocephalus* as I have said we get all grades of colour in both parts from black to more or less testaceous. In *nigricans* also we get the same range of colour in the clypeus, while the palpi, which are usually pale testaceous may be clouded at their apices. These characters therefore would not seem to be reliable ones on which to separate *minutus* from *coarctatus*, and Ganglbauer excludes the one as to the clypeus, since he mentions that in the former species there may be a small patch of brownish yellow on each side of it.

I can detect very little difference in the tarsal claws of the males in the two species; in *minutus*, the tooth is slightly larger than in *coarctatus*, but the difference is too slight to use as a character for separating the species in practice.

Here again the most reliable character for separating them seems

to be the nature of the punctuation of the upper-surface, but especially of the scutellum. In these two species, as in the case of *testaceus* and *melanocephalus*, as a rule, there is no difficulty in allocating individuals; *coarctatus* is usually lighter in colour and broader in shape than *minutus*, and in the typical examples Fowler's characters generally—but not always—hold good. After examining between 50 and 60 specimens and separating them into two groups according to the coarser or finer punctuation of the scutellum—as seen under the microscope—I found that all the typical *coarctatus* fell into the one group with finer punctuation and all the typical *minutus* into the other with coarser punctuation.

I would therefore separate the six species according to the following characters:—

1. Elytra with indistinct traces of three punctured striæ on each. Tarsal claws of ♂ with transversely striated large tooth 2
   Elytra without traces (or at most with a few large punctures) of striæ. Tarsal claws of ♂ with slightly smaller tooth not transversely striated 4
2. Tarsal claws of ♂ longer. Head, clypeus, and maxillary palpi entirely testaceous .. .. =MARITIMUS, Thoms.
   Tarsal claws of ♂ shorter. Head black, clypeus black or testaceous .. 3
3. Punctuation of uppersurface finer. Second segment of maxillary palpi dark. General colour of upper surface lighter. Clypeus usually testaceous .. .. =TESTACEUS, F.
   Punctuation of upper surface coarser. Second segment of maxillary palpi usually light. General colour of upper surface usually darker. Clypeus generally black (but may be more or less testaceous) .. =MELANOCEPHALUS, Ol.
4. Size larger (5mm.-5½mm.). Anterior claw on anterior tarsi of ♂ with tooth about half the length of claw. No dark suture to elytra .. =NIGRICANS, Zett.
   Size smaller (3½mm-4mm.). Anterior claw on anterior tarsi of ♂ with very small tooth. Elytra usually with dark suture 5
5. Punctuation of scutellum coarser. Size usually smaller, and shape narrower. Colour generally darker. Clypeus generally black, but may have a yellow spot on either side .. .. =MINUTUS, F.
   Punctuation of scutellum finer. Size usually larger, and shape broader. Colour generally lighter. Clypeus generally (always?) with a yellow spot at each side .. .. .. =COARCTATUS, Credl.

With regard to the distribution of these species in Britain, the records are at present not very numerous, but certain points seem to stand out.

Both *testaceus* and *maritimus* show a decided southern distribution. There is one Scottish record for the former (S. Aberdeen, Murray, 1853), but Dr. Sharp does not include it in his "Coleoptera of Scotland" 1871-8. This species occurs at Chaloner's Whin, York (Yorks mid-W. district) and is also recorded for south Lancashire, but these are the most northern records I can find, and the insect is certainly commoner farther south. Similarly *maritimus* is common in the S.E. of England and in East Anglia but does not occur in the north or west. The Southport record, mentioned by Fowler, has been dropped in more recent Lancashire lists, and the only other north of England records are the specimen at Greatham, Durham, many years ago, and a record for Eston Marsh (Yorks N.E. district) in 1901. Other southern species, such as *Hydaticus transversalis*, and *Pelobius tardus*, Herbst, are recorded as far north as Yorkshire, but this seems to be about the northern limit of distribution of the southern group. I

must except the south-western corner of Scotland from this statement as one or two southern forms occur there, but I will deal with this interesting point in a paper which will shortly be ready upon the aquatic Coleoptera of the Solway district.

Both *testaceus* and *maritimus* are found in the N.E. of Ireland as well as in the south. The latter is a coast species but is not recorded from the north-west—Mayo, Sligo, Donegal or Derry. Otherwise the records are sufficient to indicate that it probably occurs in all the other coast counties, and from my experience in Cork and Antrim it is probably a common species throughout. *Testaceus*, although recorded from Armagh, Down, Roscommon, Wexford and north Cork, is apparently not a common species in Ireland. The southern tendency in the distribution of this species in England is curious in view of the fact that in Siberia it ranges from Yeniseisk in the north, to Turkestan in the south.

It is difficult to describe the distribution of the next two species, as the records do not at present indicate any definite localisation. *Melanocephalus* has a wider distribution than either *testaceus* or *maritimus*, and is a fairly common species in the southern Scottish peat-mosses, but I know of no record farther north than Elgin, perhaps because the district has not been much worked! The distribution of *nigricans* agrees generally with that of *melanocephalus*, and perhaps both species belong to Watson's "British" type. Both species occur in Ireland but the records are at present few.

With regard to *minutus* and *coarctatus* the records are a little more definite. *Minutus* is either absent from, or rare in, the eastern and south-eastern counties of England, with the exception of Surrey, where it is more often recorded than *coarctatus*. It is a fairly common species in the north of England and south of Scotland, occurring chiefly in peat-mosses in the sphagnum water-holes. Dr. Sharp records it from the Tay district, and he also records *coarctatus* from the same district, but for this latter species I know of no other Scottish record, except for the three south-western, counties where it is fairly common. It is a fresh-water marsh species, as distinct from a peat-moss one, and, although it occurs with *minutus* in some localities, *e.g.*, Chaloner's Whin, York, they are not normally members of the same group.

Coarctatus then would appear to be a more southern species than *minutus*, yet in Ireland the former species occurs in the north, south and east, whereas *minutus* is so far only recorded from south Kerry and north Cork. The Irish distribution of this latter species is therefore rather extraordinary. Species confined in Ireland to the south-west, are usually regarded as the remnants of the Lusitanian fauna and flora which originated in south-west Europe, and such species do not occur in the highlands of Scotland; yet here is a species typically an inhabitant of peat-mosses, which abounds in "the land of bogs" apparently confined to a small area in the south-west of the country.

It may be possible to better understand the curiosities in the distribution of these species, after a more extended study of the distribution of all the water-beetles, but at present, and in view of the comparative scarcity of records, it would be useless to attempt to explain the causes of them.

DESCRIPTION OF PLATE IV.

Anterior claw of anterior tarsus of the six British species of *Philydrus*, Sol. ×400— 1. *Philydrus testaceus*, F. 4. *Philydrus nigricans*, Zett.
2. ,, *maritimus*, Thoms. 5. ,, *minutus*, F.
4. ,, *melanocephalus*, Ol. 6. ,, *coarctatus*, Gredl.
In connection with the drawings it should be noted that the tooth of the tarsal claw does not naturally lie in the same plane as the claw, but projects outwards to the side, so that in mounting the claw for the microscope the cover-glass presses the tooth slightly out of its natural position.

Lepidopterological notes from Co. Fermanagh.

By J. E. R. ALLEN, M.A.

These notes, on the season of 1907, will not be very complete, as I was away during August and part of September, and was compelled by various engagements to neglect some methods of collecting, *e.g.*, sugaring and sallowing. The captures, except where otherwise stated, were in the neighbourhood of Enniskillen.

The first capture worthy of note was larvæ of *Melitaea aurinia* on March 30th, one large nest, of which a few individuals had just moulted. On April 7th, in a different locality, they were found in clusters of a few, or singly, and of various sizes. On May 5th they were still plentiful, and nearly fullfed. On May 6th, I made an expedition to Correl Glen, a rather remote place among the hills, chiefly for a night hunt for larvæ. *Callophrys rubi* was found asleep on the heath, and very conspicuous in the lantern light. A late-flowering sallow produced *Pachnobia rubricosa* in plenty, *Xylocampa areola*, and the commoner sallow-frequenting species. *Eupithecia pumilata* was taken, and larvæ of the following—*Cosmotriche potatoria*, *Triphaena comes*, *Noctua glareosa*, *Crocallis elinguaria*, and *Boarmia repandata*. Another expedition to the same place on May 11th gave the following additional species—*Pararge egeria*, *Vanessa io*, *Ematurga atomaria*, *Eupithecia nanata*, *Cidaria suffumata*, *Larentia salicata*, *Panagra petraria*, *Calocampa vetusta*, and, among larvæ, one of *Oporabia autumnata*, quite small, found accidentally on a sallow catkin.

The weather about this time was wet and cold, but sandwiched in the bad weather were two fine, hot days, May 18th and 19th, of which, fortunately, I was able to take advantage. On Benaughlin, another remote locality in a different direction, I took larvæ of *Oporabia autumnata* var. *filigrammaria* in plenty, dark-green larvæ with conspicuous stripes, feeding chiefly on heath on the hillside; also larvæ of *Cidaria immanata*, *C. testata*, *Larentia caesiata*, *L. didymata*. A pair of *Aglais urticae*, *in cop.*, came unexpectedly tumbling into the tray from a clump of heath. *Tephrosia crepuscularia* (*biundularia*) was first taken on fir-trunks on May 20th, a very late first appearance. Larva-beating on May 24th produced, among other things, *Oporabia dilutata*, *Hybernia rupicapraria*, *Cheimatobia brumata*, *Cleora lichenaria*. In a day-expedition to Correl Glen, on May 25th, *Celastrina argiolus* was taken, and larvæ of *Oporabia autumnata*, *C. boreata*, *Hypsipetes sordidata*, *Himera pennaria*, *Hybernia aurantiaria*, and *Lasiocampa quercus*, in addition to many previously mentioned. A new foodplant for *Oporabia autumnata*, namely, bilberry, was added to the list, one larva being beaten from a bush overhanging the road. This larva was almost uniform apple-green, like those taken from the neighbouring birches. I may here mention that *O.* var. *filigrammaria* emerged from August 10th to September 11th, while *O. autumnata*, from wild larvæ, did not begin to appear till September 25th. The mountain-bred var.